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(71)(72) Applicant and Inventor: KIM, Young, Jin [KR/KR]; 399, Chungnyangni 2-dong, Tongdaemun-gu, Seoul 130-012 (KR).

(74) Agent: JO, Eui, Je; E.J.JO & Associates, Dae Heung Building, Suite 301, 648-23, Yuksam-dong, Kangnam-ku, Seoul 135-081 (KR).

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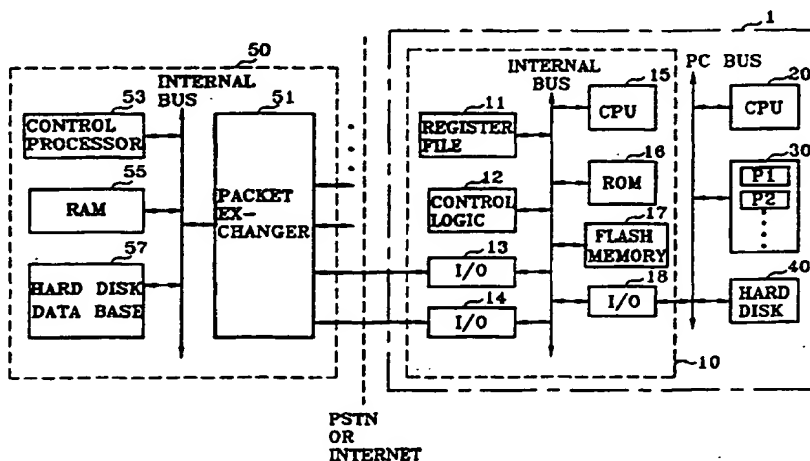
(57) Abstract

Disclosed is a management method and apparatus for copyright protection of a program-on-demand, including a base station (50) which is a program seller, a copyright management system (10) contained in a personal computer (1) which is a program purchaser, and a telephone communication network or an Internet for mutually connecting the base station (50) with the copyright management system (10). A program purchasing request command is given from the copyright management system (10), and then a user identification number is requested by the base station (50). It is discriminated whether the user identification number input according to the program purchasing request command corresponds to the copyright management system (10) to be managed by the base station (50). If it is discriminated as a corresponding user identification number, the requested program is supplied together with the program use restriction contents, to control the program to be performed within the scope of the program use restriction contents and to protect the copyright of the program which is supplied via a communication network.

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MANAGEMENT METHOD AND APPARATUS FOR
COPYRIGHT PROTECTION OF PROGRAMS-ON-DEMAND

TECHNICAL FIELD

5 The present invention relates to a system for selling and purchasing a program via a computer communication network, and more particularly, to a management method and apparatus for copyright protection of programs-on-demand so that a copyright for a purchased program can be protected.

10

BACKGROUND ART

It is expected that a computer communication having shorter history than that of a voice communication is remarkably developed in two kinds of technological fields. Firstly, a multimedia data such as a

15 picture, an image and a sound as well as character data will flow via a computer communication network. When shopping via the computer communication, all of products as well as specification thereof can be watched via displayed images. It is possible to choose a music record, after directly listening to a music played. Telephone companies are

20 developing a video-on-demand (VOD) business which handles multimedia data when communicating. A movie or music program can be received and appreciated via an on-line communication network at a user desired time, and a news can be watched as an accustomed image and sound via a communication network whenever a user

25 wants to watch it. Secondly, such a computer communication system will be changed from cable to radio, and then a user obtains desired material anytime anywhere. If an information society is established while the computer communication network is constructed, a number of software programs will be sold and purchased via a communication

30 network. Such a pattern of program supply has a merit that a cost due to a user movement can be saved and a continuously updated

software can be timely supplied. Accordingly, a copyright protection for a communication-sold program will be greatly needed.

DISCLOSURE OF INVENTION

5   Therefore, to solve the above problems, it is an object of the present invention to provide a management method for protecting a copyright of a program which is supplied via a social infrastructured communication network.

Another object of the present invention is to provide an
10   apparatus for embodying a management method for protecting a copyright of a program-on-demand.

To accomplish the one object of the present invention, there is provided a management method for protecting a copyright of a program-on-demand which is ordered and supplied using a computer
15   communication network, the copyright protection management method comprising the steps of:

transmitting a request command of purchasing a desired program;

transmitting the program corresponding to the received program purchase request command together with a detailed use restriction
20   contents of the program; and

managing that a program service is accomplished within the scope of the use restriction contents by storing the received program and the program use restriction contents.

To accomplish the other object of the present invention, there is
25   provided a management apparatus for protecting a copyright of a program-on-demand which is ordered and supplied using a computer communication network, the copyright protection management apparatus comprising:

a program sourcing base station for transmitting a program
30   corresponding to a received program purchase request command together with a detailed use restriction contents of the program;

a copyright management system for transmitting the desired program purchase request command, and managing that a program service is accomplished within the scope of the use restriction contents by storing the program received from the base station and the

5 program use restriction contents; and

a communication network for exchangeably switching between the base station and the copyright management system.

BRIEF DESCRIPTION OF THE DRAWINGS

10 FIG. 1 is a block diagram showing a management apparatus for a copyright protection of a program-on-demand according to the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

15 Hereinbelow, a preferred embodiment of the present invention will be described in detail with reference to the accompanying drawing.

FIG. 1 shows a copyright protection management apparatus for a program-on-demand according to the present invention. As shown in FIG. 1, the apparatus of the present invention comprises a base station

20 50 which is installed at a program supply side, a copyright management system 10 which is incorporated in a personal computer (PC) 1 of a program demand side, and a packet switching telecommunication network PSTN or an Internet for playing a role of a transmission path between base station 50 and copyright

25 management system 10.

Base station 50 includes a packet exchanger 51 for switching a plurality of copyright management systems. Base station 50 also includes a control processor 53 for controlling and processing a general operation, a memory such as a random access memory (RAM) 55 for

30 storing an operational program necessary for operating base station 50, and a hard disk 57 containing a data base with respect to the

copyright management systems which are controlled by base station 50 and a data base with respect to programs which are controlled by the copyright management systems. The respective components contained in base station 50 are constructed so that they are connected

5   to each other via an internal bus.

Meanwhile, copyright management system 10 contained in PC 1 includes a register file 11 for storing an identification (ID) number of copyright management system 10, a control logic unit 12 for controlling a general hardware operation of copyright management

10 system 10, and input and output (I/O) units 13 and 14 for exchangeably connecting base station 50 with copyright management system 10 via a communication network such as the Internet and PSTN. Copyright management system 10 also includes a central processing unit 15 for performing a numerical calculation operation, a

15 memory 16 composed of a read-only memory (ROM) for storing an operational program necessary for operating copyright management system 10, a flash memory 17 for storing contents of restricting the number of use frequency and a running time of a program transmitted at the time of purchasing the program, and an input and output (I/O)

20 unit 18 for connecting copyright management system 10 with the respective components in the PC 1. The respective components contained in copyright management system 10 are constructed so that they are connected to each other via an internal bus.

Personal computer 1 containing copyright management system 10

25 includes a central processing unit (CPU) 20 for controlling copyright management system 10 according to a purchase of a program and the respective components in PC 1, a memory 30 composed of a RAM for storing a plurality of programs, and a hard disk 40 for storing the purchased program. The respective components of PC 1 and I/O unit

30 18 of copyright management system 10 are constructed so that they are connected to each other via a PC bus.

An operation of a management apparatus for copyright protection of a program-on-demand according to the present invention as constructed above will be described in more detail.

When a consumer will purchase a software program which has been newly developed by a software developer via a communication network, base station 50 and copyright management system 10 play a role of mutually connecting a consumer with a software supplier. That is, base station 50 can be regarded as a software bank. Also, base station 50 are connected to copyright management system 10 with the PSTN or Internet. When purchasing a program, a purchaser should pay for the program to be purchased to base station 50. Then, a program P1 which is an interface software contained in memory 30 of PC 1 is executed to connect PC 1 with I/O unit 18 in copyright management system 10. CPU 15 of copyright management system 10 which receives a program purchase request command from a purchaser performs a necessary operation according to an operational program contained in memory 16 composed of a ROM. Here, CPU 15 can perform a numerical calculation operation and decode a program encoded in base station 50 to prevent an unauthorized copy. CPU 15 starts to communicate with base station 50 via one I/O unit among a plurality of I/O units 13 and 14 which are connected to different communication networks if a program purchase request command is input thereto. Here, first I/O unit 13 is connected to base station 50 via the PSTN being an aerial exchangeable telephone network, and second I/O unit 14 is connected to base station 50 via the Internet. Generally, the Internet represents a network itself which connects spread computers with each other, or represents all sources and information which can be accessed the network. In this connection, base station 50 and copyright management system 10 communicate with each other via a selected communication network. The packet exchanger 51 of base station 50 is possibly connected to a plurality of

copyright management systems, and transmits a user program purchase request command applied via the I/O unit of the connected copyright management system 10 to control processor 53. Control processor 53 performs a necessary operation according to an
5   operational program stored in memory 55 composed of a RAM. That is, control processor 53 recognizes a user program purchase request command and then outputs a user ID number request command of connected copyright management system 10 via the communication network. Here, the ID number represents the combination of characters
10 and figures assigned by user selection at the time of making a contract in use for user identification and user service. The user ID number request command is transmitted to copyright management system 10 via packet exchanger 51. The I/O unit of copyright management system 10 transmits the input user ID number request
15 command to CPU 15 via an internal bus. CPU 15 recognizes the user ID number request command, and then transmits the user ID number stored in register file 11 via an inverse path to base station 50. Here, register file 11 is composed of a ROM so that the user ID number is not altered at random. Control processor 53 in base station 50
20 discriminates whether a received user ID number is a user ID number of a copyright management system which is controlled by control processor 53 while being formed as a data base in hard disk 55. Control processor 53 modifies the program which is requested by the user so that the program is only run in copyright management system
25 10 having the user ID number and transmits the modified program to PC 1 via copyright management system 10, if the transmitted user ID number is a user ID number of a copyright management system which is controlled by control processor 53. The data base contained in hard disk 55 has items such as user personal particulars, user ID
30 numbers of copyright management systems, a list of programs sold to the purchaser, and the number of use frequency and running time for

restricting use of the program. CPU 15 in copyright management system 10 decodes an encoded program supplied from base station 50, and makes the encoded program executable. Copyright management system 10 stores the decoded program in hard disk 40 or memory 30 in PC 1. Base station 50 transmits the program together with the contents for restricting use of the program. The use restriction contents are stored in a flash memory 17 in copyright management system 10. Here, the use restriction contents restrict the use frequency of the program or the running time. Generally, a flash memory is a kind of a non-volatile memory in which stored information does not disappear even if power is off, differently from a dynamic RAM (DRAM) or a static RAM (SRAM). The use restriction contents of the program stored in flash memory 17 are not altered by the user at random. When altering the use restriction contents of the program stored in flash memory 17, that is, when increasing the number of the use frequency of the program used by the user, base station 50 instructs copyright management system 10 to update the number of the use frequency upon the receipt of the request in base station 50. Then, copyright management system 10 updates the number of the use frequency stored in flash memory 17 according to an instruction of base station 50. Also, when information representing that the program is in use via I/O unit 18 is input during performing the program, the number of the use frequency stored in flash memory 17 is decreased by "1" whenever the information is input.

To protect a copyright of the purchased program, if the program in use is beyond the limit with respect to the number of the program use frequency and the running time stored in flash memory 17, copyright management system 10 cannot use the program as there is no response to the request during performing the program. If the program version is continuously updated, base station 50 being a program supplier publishes the fact and transmits it to a user of

copyright management system 10 which constructs and manages a data base in hard disk 55. Base station 50 can use various methods for publishing version-updated programs. As an example, an automatic dialing function can be included in I/O units 13 and 14 of copyright

5   management system 10. Meanwhile, when a user requests base station 50 to version-update the purchased program, ·the program version is updated via the same path as that of the program purchasing within the scope of the limit which permits the copyright of the program. The operational program for selling and purchasing programs is stored

10 in memory 30 composed of a RAM in the user's PC 1, memory 16 composed of a ROM in copyright management system 10 contained in PC 1, and memory 55 composed of a RAM in base station 50, respectively, so as to give and take mutually necessary encoded instructions. Here, the mutual instructions and the selling programs

15 communicating between base station 50 and copyright management system 10 have encoded patterns to prevent illegal use in the other copyright management systems having the other user ID numbers.

On the other hand, when each hardware component in copyright management system 10 is in an abnormal state, a program purchasing

20 function or a management function for copyright protection of the purchased program is not normally performed. Thus, CPU 15 in copyright management system 10 checks all components by hardware according to an operational program stored in memory 16 composed of a ROM to recognize each state of the hardware, and then sends a

25 state report to base station 50. Such a state checking operation can be performed at the time when power is supplied, before the program is purchased, or when the purchased program is performed. Also, control processor 53 in base station 50 can check states of the copyright management systems which are controlled according to the operational

30 program stored in memory 55 composed of a RAM.

As described above, the present invention relates a management

method and apparatus for copyright protection of a program-on-demand, and supplies a program which is sold and purchased via a communication network together with contents of limiting the number of use frequency and running time, to perform a program running within the scope of the use restriction contents. Accordingly, a copyright of the program which is supplied via the communication network can be protected and controlled.

INDUSTRIAL APPLICABILITY

The management method and apparatus for copyright protection of a program according to the present invention can be applied to a program-on-demand business and a video-on-demand business using a communication network. Also, the present invention can be applied to a bidirectional cable TV (CATV) system and an interactive CATV system.

WHAT IS CLAIMED IS:

1.   A management apparatus for protecting a copyright of a program-on-demand which is ordered and supplied using a computer communication network, said copyright protection management apparatus comprising:

a program sourcing base station (50) for transmitting a program corresponding to a received program purchase request command together with a detailed use restriction contents of the program;

a copyright management system (10) for transmitting the desired program purchase request command, and managing that a program service is accomplished within the scope of the use restriction contents by storing the program received from said base station (50) and the program use restriction contents; and

a communication network (PSTN or Internet) for exchangeably switching between said base station (50) and said copyright management system (10).

2.   The management apparatus for copyright protection of a program-on-demand according to claim 1, wherein said base station (50) transmits a user identification number request command to said copyright management system (10) when receiving the program purchasing request command, and supplies an ordered program and the use restriction contents of the program if the received user identification number corresponds to a user identification number stored in the copyright management system (10).

3.   The management apparatus for copyright protection of a program-on-demand according to claim 2, wherein said copyright management system (10) transmits a pre-assigned user identification number according to the received user identification number request command stored in a personal computer (1), and checks the number of use frequency and running time every time the program is performed, to thereby stop the program use if the checked use frequency and

running time reach a designated use frequency and running time.

4.   The management apparatus for copyright protection of a program-on-demand according to claim 1, wherein said communication network is an aerial exchangeable telephone network such as a packet switching telecommunication network or an Internet.

5.   The management apparatus for copyright protection of a program-on-demand according to claim 2, wherein said base station (50) comprises:

a packet exchanger (51) which is connected with a plurality of copyright management systems (10);

a memory (55) composed of a RAM which stores an operational program necessary for operating said base station (50);

a control processor (53) for controlling and processing a general operation of each component according to the operational program of said memory (55); and

a hard disk (57) for storing, as a data base, items such as user personal particulars, user identification numbers of the copyright management systems (10) to be managed, a list of programs supplied to the respective copyright management systems (10), and the number of use frequency and running time for restricting use of the program.

6.   The management apparatus for copyright protection of a program-on-demand according to claim 3, wherein said personal computer (1) containing said copyright management system(10) comprises a central processing unit (20) for controlling said copyright management system (10) and respective components according to the program purchasing; and

a memory (30) for storing an interface program interfacing said copyright management system (10), an operational program and the purchased program.

7.   The management apparatus for copyright protection of a program-on-demand according to claim 3, wherein said copyright

management system (10) comprises:

a register file (11) for storing a user identification number and composed of a read-only memory (ROM) so that the stored identification number is not altered at random;

5   input and output units (13, 14) for exchangeably connecting said copyright management system (10) with said base station (50) and the respective components of said personal computer (1), respectively;

a memory (16) composed of a ROM for storing an operational program necessary for operating said copyright management system
10   (10);

a flash memory (17) for storing use restriction contents with respect to the use frequency and the running time of the program received from said base station (50); and

a central processing unit (15) for controlling operations of the
15   respective components according to the operational program.

8.   The management apparatus for copyright protection of a program-on-demand according to claim 7, wherein said copyright management system (10) does not change the program use restriction contents stored in said flash memory (17) at random, and can change
20   the program use restriction contents by transmitting a use restriction contents alteration request command to said base station (50) and then receiving an alteration command from said base station (50).

9.   A management method for protecting a copyright of a program-on-demand which is ordered and supplied using a computer
25   communication network, the copyright protection management method comprising the steps of:

transmitting a request command of purchasing a desired program;

transmitting the program corresponding to the received program purchase request command together with a detailed use restriction
30   contents of the program; and

managing that a program service is accomplished within the

scope of the use restriction contents by storing the received program and the program use restriction contents.
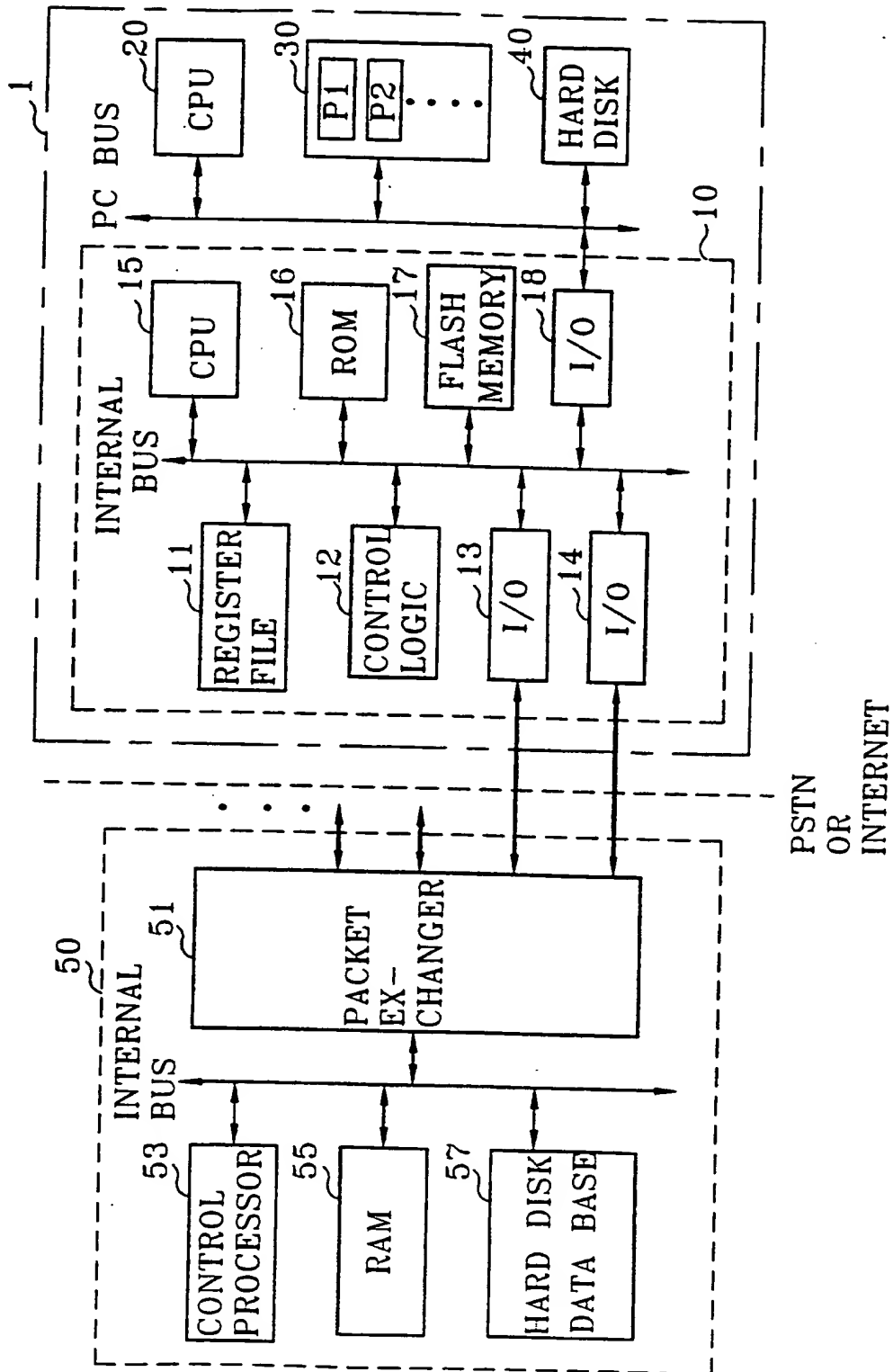
10. The management method for protecting a copyright of a program-on-demand according to claim 9, wherein said program transmitting step comprises the sub-steps of transmitting a user identification number request command to a program purchasing requester upon receipt of the program purchasing request command, and discriminating whether the input user identification number corresponds to a user identification number among user identification numbers to be managed, to thereby supply the requested program together with the use restriction contents of the program if the user identification number matches.

11. The management method for protecting a copyright of a program-on-demand according to claim 10, wherein said program purchasing request command transmitting step is of transmitting a pre-assigned user identification number upon the receipt of the user identification number request command.

12. The management method for protecting a copyright of a program-on-demand according to claim 10, wherein said managing step comprises the sub-steps of checking the use frequency and running time of the program every time the program is performed, and stopping the program use if the checked use frequency and running time match the use restriction contents.

FIG. 1

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC[6]: G 06 F 1/00, 9/06, 9/445
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
IPC[6]: G 06 F; H 04 N
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPODOC, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 5 023 907 A (JOHNSON et al.) 11 June 1991 (11.06.91), 7 pages; abstract; fig.1; column 4, line 41ff; column 5, line 12ff.	1-5,9-12 6,7-8
X	DE 39 38 479 A1 (NEW COM) 20 June 1991 (20.06.91), 5 pages; abstract; fig.1.	1,2,4,9-11
X Y	JP 6 095 870 A (MATSUSHITA) 08 April 1994 (08.04.94), abstract; fig.1.	1,2,4,9-11 6
Y	US 5 131 091 A (MIZUTA) 14 July 1992 (14.07.92), 8 pages; abstract; fig.4.	7,8

☐ Further documents are listed in the continuation of Box C.	☒ See patent family annex.

Date of the actual completion of the international search	Date of mailing of the international search report
22 July 1996 (22.07.96)	29 July 1996 (29.07.96)

Name and mailing address of the ISA/ AT AUSTRIAN PATENT OFFICE Kohlmarkt 8-10 A-1014 Vienna Facsimile No. 1/53424/535	Authorized officer Fastenbauer Telephone No. 1/53424/447

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Im Recherchenbericht angeführtes Patentdokument Patent document cited in search report Document de brevet cité dans le rapport de recherche	Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
US A 5023907	11-06-91	keine — none — rien	
DE A1 3938479	20-06-91	keine — none — rien	
JP A2 6095870	08-04-94	CA AA 2106122 JP A2 7084780 JP A2 6119265	15-03-94 31-03-95 28-04-94
US A 5131091	14-07-92	JP A2 1296361	29-11-89